

曲靖市 2019-2020 学年秋季学期教学质量监测

# 九年级数学参考答案及评分标准

一、

1.  $x \geq -3$ ; 2. 15; 3. -1; 4.  $(-1)^{n+1}(n^2+1)$ ; 5. 50; 6. (8, 6) 或 (4, -6)

二、

|    |   |   |   |    |    |    |    |    |
|----|---|---|---|----|----|----|----|----|
| 题号 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 答案 | B | C | A | A  | D  | D  | C  | B  |

三、

15. 解：原式  $= 3+1-9+\sqrt{3}-1 \dots\dots 4$  分

$$= -6+\sqrt{3} \dots\dots 5 \text{ 分}$$

16. 解：原式  $= \frac{a-2}{(a+1)^2} \div \frac{a(a-2)}{a+1}$

$$= \frac{a-2}{(a+1)^2} \cdot \frac{a+1}{a(a-2)}$$

$$= \frac{1}{a(a+1)} \dots\dots 4 \text{ 分}$$

$\because a$  是方程  $2x^2+2x-3=0$  的解，

$$\therefore 2a^2+2a-3=0, \text{ 即 } a(a+1) = \frac{3}{2},$$

$$\therefore \text{原式} = \frac{2}{3}. \dots\dots 7 \text{ 分}$$

17. 解：(1)  $\because$  关于  $x$  的一元二次方程  $x^2-6x+(2m+1)=0$  有实数根，

$$\therefore \Delta = (-6)^2 - 4(2m+1) = 32 - 8m \geq 0,$$

解得：  $m \leq 4$ .  $\dots\dots 3$  分

(2)  $\because x_1, x_2$  为方程  $x^2-6x+(2m+1)=0$  的两根，

$$\therefore x_1+x_2=6, x_1x_2=2m+1.$$

$$\because 2x_1x_2+x_1+x_2 > 4,$$

$$\therefore 2(2m+1)+6 > 4$$

$$\therefore m > -1 \dots\dots 6 \text{ 分}$$

$$\text{又 } \because m \leq 4, \therefore -1 < m \leq 4 \dots\dots 7 \text{ 分}$$

18. 解：(1);  $\because$  学习小组共有 4 名同学，其中女生占 3 名；

$$\therefore P(\text{女生展示}) = \frac{3}{4}; \dots\dots 2 \text{ 分}$$

(2) 列表如下：

|     | 男       | 女 1       | 女 2       | 女 3       |
|-----|---------|-----------|-----------|-----------|
| 男   |         | (女 1、男)   | (女 2、男)   | (女 3、男)   |
| 女 1 | (男、女 1) |           | (女 2、女 1) | (女 3、女 1) |
| 女 2 | (男、女 2) | (女 1、女 2) |           | (女 3、女 2) |
| 女 3 | (男、女 3) | (女 1、女 3) | (女 2、女 3) |           |

共有 12 种等可能的结果数，其中一男一女的结果数为 6，……6 分

$$\text{所以 } P(\text{恰为一男一女}) = \frac{6}{12} = \frac{1}{2}. \quad \dots\dots 7 \text{ 分}$$

19. 解：(1)  $y = (x - 50)(-x + 100)$

$$\therefore y = -x^2 + 150x - 5000; \quad \dots\dots 4 \text{ 分}$$

$$(2) y = -(x - 75)^2 + 625$$

$\therefore$  当  $x = 75$  时获得的利润最大，最大利润为 625 元

$\because 700 > 625$

$\therefore$  销售利润不能达到 700 元.  $\dots\dots 7 \text{ 分}$

20. (1) 证明： $\because \triangle A'CB' \cong \triangle ACB$ ,

$$\therefore CA' = CA,$$

$\because$  图①中的  $\triangle A'B'C$  顺时针旋转  $45^\circ$  得图②,

$$\therefore \angle B'CB = \angle A'CA = 45^\circ,$$

$$\therefore \angle BCA' = 45^\circ$$

在  $\triangle CQA'$  和  $\triangle CP'A$  中,

$$\begin{cases} \angle QCA' = \angle P'CA \\ CA' = CA \\ \angle A' = \angle A \end{cases}$$

$$\therefore \triangle CQA' \cong \triangle CP'A,$$

$$\therefore CP' = CQ;$$

$\dots\dots 4 \text{ 分}$

(2) 解：过点  $P'$  作  $P'P \perp AC$  于点  $P$ , 如图②,

在  $\text{Rt}\triangle AP'P$  中,  $\because \angle A = 30^\circ$ ,

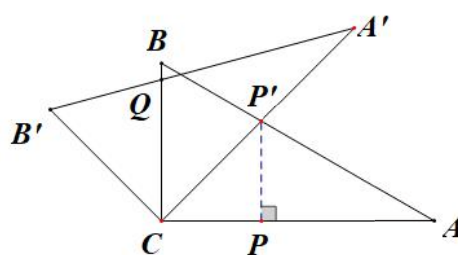
$$\therefore P'P = \frac{1}{2}AP' = \frac{1}{2} \times 3 = \frac{3}{2},$$

在  $\text{Rt}\triangle CP'P$  中,  $\because \angle P'CP = 45^\circ$ ,

$$\therefore CP = P'P = \frac{3}{2},$$

$$\therefore CP' = \sqrt{\left(\frac{3}{2}\right)^2 + \left(\frac{3}{2}\right)^2} = \frac{3\sqrt{2}}{2}$$

$$\therefore CQ = CP' = \frac{3\sqrt{2}}{2}. \quad \dots\dots 8 \text{ 分}$$



图②

21. (1) 证明：连接  $OE$ ,

$$\because AC = EC, OA = OE,$$

$$\therefore \angle CAE = \angle CEA, \angle FAO = \angle FEO,$$

$\because AC \perp AB$ ,  
 $\therefore \angle CAD = 90^\circ$ ,  
 $\therefore \angle CAE + \angle EAO = 90^\circ$ ,  
 $\therefore \angle CEA + \angle AEO = 90^\circ$ ,  
 即  $\angle CEO = 90^\circ$ ,  
 $\therefore OE \perp CD$ ,

$\therefore CE$  为  $\odot O$  的切线;

(2) 解:  $\because \angle OAF = 30^\circ$ ,  $OF \perp AF$

设  $OF = x$ ,  $\therefore OA = 2OF = 2x$

$$\therefore (2\sqrt{3})^2 + x^2 = 2x^2$$

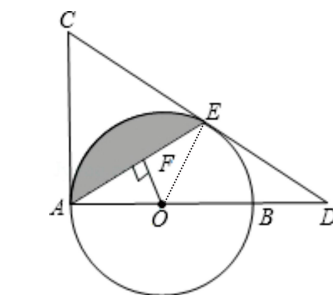
解得  $x = 2$ ,  $\therefore OA = 4$

$$\therefore S_{\triangle EAO} = 4\sqrt{3} \times 2 \times \frac{1}{2} = 4\sqrt{3}$$

$\because \angle AOE = 120^\circ$ ,  $AO = 4$ ;

$$\therefore S_{\text{扇形} EAO} = \frac{120 \times \pi \times 16}{360} = \frac{16\pi}{3}$$

$$\therefore S_{\text{阴影}} = \frac{16\pi}{3} - 4\sqrt{3}.$$



.....4 分

22. 解: (1) 依题意得 
$$\begin{cases} 4a - 2b + c = 0 \\ -\frac{b}{2a} = 1 \\ c = 6 \end{cases}$$

$$\text{解得} \begin{cases} a = -\frac{3}{4} \\ b = \frac{3}{2} \\ c = 6 \end{cases}$$

故抛物线的解析式为:  $y = -\frac{3}{4}x^2 + \frac{3}{2}x + 6$  .....3 分

(2) A(-2, 0) 关于  $x=1$  的对称点 B (4,0)

如图所示, 过点 P 做 y 轴的平行线交直线 BC 于点 D, 设直线 BC 的解析式为  $y=kx+b$

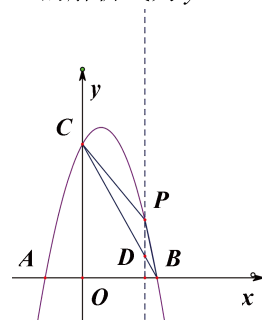
$$\therefore \begin{cases} 4k + b = 0 \\ b = 6 \end{cases}$$

$$\text{解得 } k = -\frac{3}{2}$$

$$\therefore y = -\frac{3}{2}x + 6 \quad \text{.....5 分}$$

设点  $P(m, -\frac{3}{4}m^2 + \frac{3}{2}m + 6)$ , 则点  $D(m, -\frac{3}{2}m + 6)$

$$S_{\triangle BPC} = \frac{1}{2} PD \times OB = 2 \left( -\frac{3}{4}m^2 + \frac{3}{2}m + 6 - \left( -\frac{3}{2}m + 6 \right) \right) = 2 \left( -\frac{3}{4}m^2 + 3m \right), \quad \text{.....7 分}$$



$$\therefore 2\left(-\frac{3}{4}m^2+3m\right)=\frac{9}{2},$$

解得:  $m_1=1, m_2=3$

又  $\because 1 < m < 4, \therefore m=3$

$$\therefore y_p = -\frac{3}{4} \times 3^2 + \frac{3}{2} \times 3 + 6 = \frac{15}{4}, \therefore \text{点 } P(3, \frac{15}{4})$$

.....9 分

23. (1) 证明:  $\because$  直径  $AB \perp CD$ ,

$$\therefore \widehat{AD} = \widehat{AC}, \therefore \angle ACD = \angle ADC,$$

$$\because AE = CE, \therefore \angle ACD = \angle CAE,$$

$$\therefore \angle ADC = \angle CAE. \quad \text{.....3 分}$$

(2) 如图, 连接  $OD$ .

$$\because GD \text{ 是 } \odot O \text{ 的切线}, \therefore GD \perp OD$$

$$\therefore \angle GDO = 90^\circ, \therefore \angle GDF + \angle ODF = 90^\circ$$

$$\because AB \perp CD, \therefore \angle DFO = 90^\circ,$$

$$\therefore \angle ODF + \angle AOD = 90^\circ$$

$$\therefore \angle GDF = \angle AOD \quad \text{.....5 分}$$

$$\text{又 } \because \angle ACE = \angle EAC,$$

$$\therefore \angle GED = \angle ACE + \angle EAC = 2\angle ACE,$$

$$\because \angle AOD = 2\angle ACE, \therefore \angle GED = \angle AOD$$

$$\therefore \angle GDF = \angle GED,$$

$$\therefore GD = GE \quad \text{.....7 分}$$

(3) 如图, 连接  $GO$  交  $\odot O$  于  $M'$ , 延长  $GO$  交  $\odot O$  于  $M$ ,

此时线段  $GM'$  最小, 线段  $GM$  最大.

$$\because F \text{ 为 } OA \text{ 中点}, CD \perp AB,$$

$$\therefore CD \text{ 垂直平分 } OA, \therefore DA = DO,$$

$$\text{又 } \because OA = OD, \therefore OA = OD = DA,$$

$$\therefore \triangle AOD \text{ 为等边三角形.}$$

$$\therefore \angle AOD = 60^\circ,$$

$$\therefore \angle GDF = \angle AOD = 60^\circ,$$

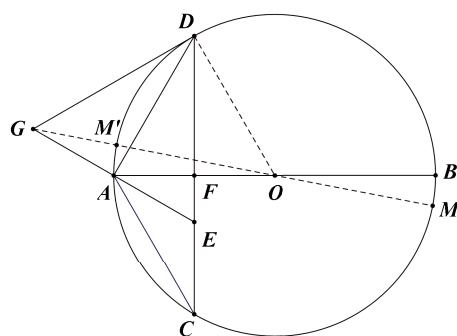
$$\because GD = GE,$$

$$\therefore \triangle GDE \text{ 为等边三角形,}$$

$$\therefore GD = DE.$$

$$\therefore AD = OD = 12, AF = \frac{1}{2}OA = 6,$$

$$\therefore CF = DF = \sqrt{12^2 - 6^2} = 6\sqrt{3},$$



设  $AE = x$ ，则  $CE = x$ ， $\therefore EF = 6\sqrt{3} - x$

$$\therefore 6^2 + (6\sqrt{3} - x)^2 = x^2, \text{ 解得 } x = 4\sqrt{3}$$

$$\therefore GD = DE = 12\sqrt{3} - 4\sqrt{3} = 8\sqrt{3}, \quad \dots\dots 9 \text{ 分}$$

$$\therefore GO = \sqrt{(8\sqrt{3})^2 + 12^2} = 4\sqrt{21}$$

$$\therefore GM \text{ 最小为 } 4\sqrt{21} - 12, \text{ 最大为 } 4\sqrt{21} + 12$$

$$\therefore 4\sqrt{21} - 12 \leq a \leq 4\sqrt{21} + 12. \quad \dots 12 \text{ 分}$$